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Material has been gathered and prepared for distribution in *Fungi Columbiani* preparatory to which it would seem desirable to give the species a name. It may be characterized as follows:

SYNCHYTRIUM SCIRPI Davis n. sp., subg. Pycnochytrium.—Spots minute, reddish brown. Distortion of the host slight, the “galls” seldom projecting more than 50  $\mu$  from the surface of the leaf. Resting spores amphigenous, scattered or aggregated, produced singly in the epidermal cells, globose, ovoid, elliptical, euboidal or brick shaped, 60-110  $\times$  50-75  $\mu$  in diameter. Epispore dark brown; endospore lighter brown, 3-5  $\mu$  thick. Spore contents coarsely granular, staining black with osmid acid.

On leaves of *Scirpus atrovirens* Mühl., Kenosha county, Wisconsin, August and September.

Racine, Wisconsin, August 1905.

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## NORTH AMERICAN SALVIA-RUSTS.

E. W. D. HOLWAY.

PUCCINIA VERTI-SEPTA Tracy & Gal. Jour. Mycol. 4:21, 1888. Diorchidium Tracyi DeToni. Sacc. Syl. 7:736, 1888. Jour. Mycol. 5:95, 1889.

O. Spermogonia few, in the center of the clusters of aecidia, epiphyllous, about 80  $\mu$  in diameter.

I. Aecidia epiphyllous, on yellow spots 1-2 mm. in diameter, surrounding the spermagonia mostly 8-10 on the spot, minute, 160-240  $\mu$  in diameter, low, peridia split into irregular segments; aecidiospores very irregular in shape and size, globose, ovate, angular, elliptical, or with one or both ends acute, and with the exception of the globose ones, with both ends thickened up to 8  $\mu$ , tuberculate, pale brown, 28-40  $\times$  18-26  $\mu$ ; germ-pores numerous, minute.

III. Teleutosori black, amphigenous, pulverulent, punctiform, sometimes occurring only on the margin of the underside of the leaves, causing a discoloration about 5 mm. in width all the way around; teleutospores globose, tuberculate, septa all vertical, apex mostly with a broad cap about 4  $\mu$  thick, 28-36  $\times$  24-38  $\mu$ ; pedicel hyaline, fragile, up to 75  $\mu$  long.

On *Salvia Sessei* Benth. Cuernavaca, Mex. Sept. 26, 1898, No. 3012 (type for the aecidium); Sept. 30, 1899, No. 3539. On *Salvia ballotaeflora* Benth. New Mex. (type for III.). No uredospores could be found, although search was made for them each year. If the teleutospores are treated with caustic they swell so as to measure 36-44  $\times$  36  $\mu$ , and the caps become very distinct. The germ-pores of the teleutospores are not all at or near the

poles, but both are sometimes at the base near the pedicel, sometimes at the apex, and occasional one at the base and one at the apex. The tubercles are deciduous, and a slight movement of the cover glass is sufficient to break them all off of the aecidiospores, leaving them minutely roughed. They are found in this condition in old sori; so, too, are the teleutospores.

The type specimen was found in the Herb. of the U. S. Department of Agriculture and was divided between the Herb. and Mr. Tracy. The Washington specimen seems to have disappeared from the collection. I am indebted to Dr. Trelease for an opportunity to examine the Tracy specimen. It is a fragment of a leaf with a few sori, but there was one aecidium with a portion of the peridium attached, and there is no doubt about the uredospores described by the authors of the species being aecidiospores. Those seen measured  $24-28 \times 26-38 \mu$ , and possessed the same numerous minute germ-pores found in the Mexican specimens; the tubercles had dropped off, leaving them "slightly roughened," as described by the authors for their uredo. The teleutospores could not be examined thoroughly as the type was so small, but the three examined did not differ in any way from the Mexican specimens. The walls of the teleutospores are  $2-3 \mu$  thick.

This is a typical *Diorchidium* of the *D. Woodii* type, but there does not seem to be sufficient reason for separating it from *Puccinia*.

*PUCCINIA CAULICOLA* Tracy & Gal. Jour. Mycol. 4: 20, 1888. *Puccinia nigrescens* Peck. Bot. Gaz. 3: 35, 1878. (Not *P. nigrescens* Kirchn. Lotus. 6: 132, 1856.) *Puccinia Salviae lanceolatae* Bubak. Sydow, Monogr. Ured. 1: 294, 1902. *Aecidium caulicolum* Kellerm. Jour. Mycol. 9: 227, 1903.

Mexico; On *Salvia lanceolata* Willd. Pachuca, Oct. 5, 1899, No. 3583; near Tula. Sept. 20, 1898, No. 3201; U. S., in New Mex., Kans., and S. Dak.

This species occurs on *Salvia lanceolata* only, so far as known. The specimens on *Salvia Pitcheri* Torr (*S. azurea grandiflora* Benth.) which have been referred here are *Puccinia farinacea* Long.

*PUCCINIA MITRATA* SYD. Monogr. Ured. 1: 294, 1902.

Mexico; On *Salvia sessilifolia* Gray, Guadalajara, Oct. 13, 1896; *S. polystachya* Ort. Uruapam, Oct. 12, 1899, No. 3620; Amecameca, Oct. 31, 1899, No. 3766; Patzcuaro, Oct. 16, 1898, No. 3009; *S. tiliaefolia* Vahl, Guadalajara, Sept. 16, 1899, No. 3434; *S. fluviatilia* Fernald, Cuernavaca, Sept. 27, 1898, No. 3028; *S. vitifolia* Benth. Oaxaca, Oct. 21, 1899, No. 3709; *S. purpurea* Cav. Chapala, Sept. 25, 1899, No. 3500; Etzatlan, Jalisco, Oct. 2, 1903, No. 5089; Oaxaca, Oct. 18, 1899, No. 3674; *S. amarissima* Ort. Pachuca, Oct. 5, 1899, No. 3574; Morelia,

Oct. 8, 1899, No. 3590; *S. mexicana* L. City of Mex., Oct. 2, 1896; *S. hyptoides* Mart. & Gal. Oaxaca, Oct. 11, 1894, C. G. Pringle; *Salvia* sp. Oaxaca, Oct. 18, 1899, No. 3666.

The most common *Salvia* rust in Mexico.

*PUCCINIA INFREQUENS* Holway n. sp. — Sori hypophyllous, light brown, minute, scattered.

II. Uredospores light brown, globose, echinulate, 20-24  $\mu$  in diameter.

III. Teleutospores light brown, elliptical to oblong, rarely globose, tuberculate, cells rounded at both ends, apex mostly with a broad cap, wall 2-3  $\mu$  thick, pedicel hyaline, fragile, about the length of the spore.

On *Salvia cinnabarina* Mart. & Gal. Oaxaca, Mex. Oct. 18, 1899, No. 3669.

*PUCCINIA BADIA* Holway n. sp. — Sori amphigenous, punctiform, scattered.

II. Uredosori brown; uredospores light brown, echinulate, wall thin, globose, ovate, or angular, 18-24  $\mu$ , mostly 20  $\mu$  in diameter, often thinner and lighter colored on one side.

III. Teleutosori black; teleutospores dark chestnut-brown, almost opaque, coarsely tuberculate, 32-36 x 28-32  $\mu$ , wall about 4  $\mu$  thick, apex rarely with a slight cap, pedicel persistent, hyaline, up to 50  $\mu$  long, often inserted laterally or in line with the septum.

Mexico; On *Salvia albicans*, Fernald, Iguala, Nov. 4, 1903, No. 5332 (type); Sept. 3, 1900; *S. chrysantha* Mart. & Gal. Oaxaca, Oct. 21, 1899, No. 3698; On *Salvia* sp. Sayula, Jalisco, Oct. 8, 1903, No. 5131; Tehuacan, Puebla, Nov. 8, 1903, No. 5334.

*PUCCINIA GRISEOLA* Lagerh. Sydow. Mongr. Ured. 1: 296, 1902. Amecameca, Mex. Oct. 20, 1903, No. 5200. On *Salvia elegans* Vahl.

*PUCCINIA NIVEA* Holway n. sp. — Spots dark brown with a yellow or purple border; sori hypophyllous, light brown, small, compact, 4-12 on a spot, sometimes confluent and elongated along the veins of the leaf.

III. Teleutospores germinating at once, hyaline, or subhyaline with granular contents, smooth, constricted at the septum, the upper corner of the lower cell projecting, upper cell mostly larger and rounded, the lower narrowed to the pedicel, which varies from short to the length of the spore, wall of the upper cell about 4  $\mu$  thick, that of the lower thinner, apex not at all thickened or up to 12  $\mu$  thick, 40-80 x 16-28  $\mu$ .

On *Salvia purpurea* Cav. Oaxaca, Mex. Oct. 21, 1899, No. 3696; Nov. 11, 1893, No. 5378.

Minneapolis, Minn., Dec. 27, 1904.